The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An apparatus for removing liquid droplets from a gas stream, the apparatus comprising:

(a) a flowpath for the gas stream, the flowpath comprising a flowpath inlet;

(b) a collector surface, positioned adjacent to the flowpath so that the gas stream is in communication with the collector surface as the gas stream passes through the flowpath, for collecting the droplets as collected droplets;

(c) a flow conditioner in communication with the flowpath inlet, for conditioning the gas stream to provide substantially turbulent and generally axial flow of the gas stream through the flowpath; and

(d) a drainage mechanism associated with the collector surface, for draining the collected droplets from the collector surface.

2. The apparatus as claimed in claim 1 wherein the flowpath is defined by the collector surface.

3. The apparatus as claimed in claim 1 wherein the collector surface is comprised of a generally planar surface.

4. The apparatus as claimed in claim 2 wherein the collector surface is comprised of a plurality of generally planar surfaces.

5. The apparatus as claimed in claim 2 wherein the collector surface is comprised of a generally cylindrical surface.

6. The apparatus as claimed in claim 2 wherein the drainage mechanism is comprised of at least one aperture defined by the collector surface.

7. The apparatus as claimed in claim 2 wherein the drainage mechanism is comprised of a plurality of slits defined by the collector surface.

8. The apparatus as claimed in claim 7 wherein the flowpath is further comprised of a flowpath end and wherein the slits are spaced axially along the collector surface between the flowpath inlet and the flowpath end.

9. The apparatus as claimed in claim 2 wherein the flowpath is further comprised of a flowpath end and wherein the flowpath is oriented so that the flowpath end is positioned below the flowpath inlet.

10. The apparatus as claimed in claim 2, further comprising a collection vessel associated with the drainage mechanism, for receiving the drained collected droplets.

11. The apparatus as claimed in claim 2 wherein the flowpath is further comprised of a flowpath end and wherein the drainage mechanism drains the gas stream from the flowpath, further comprising a collection vessel associated with the drainage mechanism, for receiving the drained collected droplets and the drained gas stream.

12. The apparatus as claimed in claim 11 wherein the collection vessel is comprised of a gravity separation vessel, for separating the drained collected droplets and the drained gas stream into a plurality of products.

13. The apparatus as claimed in claim 2 wherein the collector surface is wettable by the droplets.

14. The apparatus as claimed in claim 2 wherein the collector surface is a textured surface.

15. The apparatus as claimed in claim 5 wherein the flowpath has a diameter of between about 15 millimeters and about 50 millimeters.

16. The apparatus as claimed in claim 2, further comprising a cooler for cooling the gas stream before the gas stream enters the flowpath.

17. An apparatus for removing liquid droplets from a gas stream, the apparatus comprising:

(a) a plurality of parallel flowpath assemblies, each of the flowpath assemblies comprising:

(i) a flowpath for the gas stream, the flowpath comprising a flowpath inlet;

(ii) a collector surface, positioned adjacent to the flowpath so that the gas stream is in communication with the collector surface as the gas stream passes through the flowpath, for collecting the droplets as collected droplets;

(iii) a flow conditioner in communication with the flowpath inlet, for conditioning the gas stream to provide substantially turbulent and generally axial flow of the gas stream through the flowpath;

(iv) a drainage mechanism associated with the collector surface, for draining the collected droplets from the collector surface; and

(b) a distributor associated with the flowpath inlets, for distributing the gas stream to the flowpaths.

18. The apparatus as claimed in claim 17 wherein each of the flowpaths is defined by the collector surfaces.

19. The apparatus as claimed in claim 18 wherein each of the collector surfaces is comprised of generally planar surfaces.

20. The apparatus as claimed in claim 18 wherein each of the collector surfaces is comprised of generally cylindrical surfaces.

21. The apparatus as claimed in claim 18 wherein each of the drainage mechanisms is comprised of a plurality of apertures defined by the collector surface.

22. The apparatus as claimed in claim 18 wherein each of the drainage mechanisms is comprised of a plurality of slits defined by the collector surface.

23. The apparatus as claimed in claim 22 wherein each of the flowpaths is further comprised of a flowpath end and wherein the slits are spaced axially along the collector surface between the flowpath inlet and the flowpath end.

24. The apparatus as claimed in claim 18 wherein each of the flowpaths is further comprised of a flowpath end and wherein each of the flowpaths is oriented so that the flowpath end is positioned below the flowpath inlet.

25. The apparatus as claimed in claim 18, further comprising a collection vessel associated with the drainage mechanisms, for receiving the drained collected droplets.

26. The apparatus as claimed in claim 18 wherein each of the flowpaths is further comprised of a flowpath end and wherein the drainage mechanisms drain the gas stream from the flowpath, further comprising a collection vessel associated with the drainage mechanisms, for receiving the drained collected droplets and the drained gas stream.

27. The apparatus as claimed in claim 26 wherein the collection vessel is comprised of a gravity separation vessel, for separating the drained collected droplets and the drained gas stream into a plurality of products.

28. The apparatus as claimed in claim 18 wherein each of the collector surfaces is wettable by the droplets.

29. The apparatus as claimed in claim 18 wherein each of the collector surfaces is a textured surface.

30. The apparatus as claimed in claim 20 wherein each of the flowpaths has a diameter of between about 15 millimeters and about 50 millimeters.

31. The apparatus as claimed in claim 18, further comprising a cooler associated with each of the flowpath inlets, for cooling the gas stream before the gas stream enters the flowpaths.

32. A method of removing liquid droplets from a gas stream, comprising:

(a) conditioning the gas stream so that the gas stream exhibits substantially turbulent flow;

(b) passing the gas stream generally axially through a flowpath under substantially turbulent flow conditions so that the gas stream is in communication with a collector surface positioned adjacent to the flowpath, thereby causing the droplets to collect on the collector surface as collected droplets; and

(c) draining the collector surface to remove the collected droplets from the collector surface.

33. The method as claimed in claim 32 wherein the gas stream is passed through the flowpath such that re-entrainment into the gas stream of the collected droplets is minimized.

34. The method as claimed 32 wherein the gas stream is passed through the flowpath at a superficial velocity which is less than the critical atomization gas velocity of the gas stream in the flowpath.

35. The method as claimed in claim 32 wherein the gas stream is passed through the flowpath under conditions such that the Weber number is less than or equal to about 30.

36. The method as claimed in claim 32 wherein the flowpath is generally cylindrical and wherein the gas stream is passed through the flowpath substantially under annular flow conditions.

37. The method as claimed in claim 32 wherein the gas stream is passed through the flowpath at a superficial velocity of no greater than about 10 meters per second.

38. The method as claimed in claim 32 wherein the gas stream is passed through the flowpath at a superficial velocity of no greater than about 8 meters per second.

39. The method as claimed in claim 32 wherein the gas stream is passed through the flowpath at a superficial velocity of between about 6 meters per second and about 8 meters per second.

40. The method as claimed in claim 32 wherein the flowpath is generally cylindrical and wherein the flowpath has a diameter of between about 15 millimeters and about 50 millimeters.

41. The method as claimed in claim 32 wherein the flowpath is comprised of a flowpath inlet and a flowpath end and wherein the flowpath is oriented so that the flowpath end is below the flowpath inlet.

42. The method as claimed in claim 41 wherein the draining step is comprised of allowing the collected droplets to move along the collector surface under the influence of gravity.

43. The method as claimed in claim 32 wherein the collector surface defines at least one aperture and wherein the draining step is further comprised of allowing an amount of the collected droplets to pass through the aperture.

44. The method as claimed in claim 32, further comprising the step of receiving in a collection vessel the collected droplets which are drained from the collector surface.

45. The method as claimed in claim 32 wherein the draining step is further comprised of draining the gas stream from the flowpath with the collected droplets.

46. The method as claimed in claim 45, further comprising the step of receiving in a collection vessel the drained collected droplets and the drained gas stream.

47. The method as claimed in claim 46, further comprising the step, following the collection vessel receiving step, of separating the drained collected droplets and the drained gas stream to produce a plurality of products.

48. The method as claimed in claim 32, further comprising the step, before the step of passing the gas stream through the flowpath, of cooling the gas stream.

49. The method as claimed in claim 32 wherein at least fifty percent of the droplets by weight have a size within a range of sizes between about 1 μm and about 100 μm.

50. The method as claimed in claim 32 wherein at least fifty percent of the droplets by weight have a size within a range of sizes between about 1μm and about 50 μm.

51. The method as claimed in claim 32 wherein at least fifty percent of the droplets by weight have a size within a range of sizes between about 1μm and about 20 μm.

52. The method as claimed in claim 32 wherein the collector surface is wettable by the droplets.

53. The method as claimed in claim 32, further comprising the step of coalescing the collected droplets on the collector surface before draining the collected droplets.